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UNITED STATES DEPARTMENT OF AGRICULTURE

REPORT OF EUROPEAN CORN-BORER CONTROL CAMPAIGN BY THE UNITED STATES DEPARTMENT OF AGRICULTURE

FOR THE PERIOD MARCH 14, 1927
TO OCTOBER 31, 1927, INCLUSIVE

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DEPARTMENT OF AGRICULTURE,
OFFICE OF THE SECRETARY,
Washington, D. C., December 5, 1927.

SIR: Pursuant to the joint resolution entitled "Joint resolution making an appropriation for the eradication or control of the European corn borer," approved February 23, 1927, Public Resolution No. 55, Sixty-ninth Congress, I transmit herewith report of the campaign by the Department of Agriculture for the control of the European corn borer, presenting detailed classification of expenditures made from the aforesaid appropriation prior to November 1, 1927.

Respectfully,

W. M. JARDINE,
Secretary of Agriculture.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

INTRODUCTION

No insect invader in historic times has caused such widespread dread and consternation among American agriculturists as has the advent in America of a small voracious caterpillar, now widely known as the European corn borer. This pest is believed to have arrived in 1909–10, hidden away in the stems of baled broomcorn which was imported during these years from Hungary and Italy in quantities totaling nearly 10,000 tons. Large shipments of this were definitely traced to St. Thomas, Ontario; Boston, Mass.; Amsterdam and Buffalo, N. Y., where infestations subsequently developed. Smaller shipments of such material were also traced to Chicago, Ill.; Dubuque, Iowa; New Orleans, La.; and other points at which no infestation has since developed.

The moths or flying adults of the insect escaped from the broomcorn and the borer soon became established at St. Thomas, Ontario; Scotia, near Amsterdam, N. Y.; and in the vicinity of Buffalo, N. Y., although it was first discovered near

Boston, Mass., where a large quantity of the baled material formerly had been stored in an old frame building.

The late Stuart C. Vinal, who was detailed by the Massachusetts Agricultural College to investigate market garden insects, discovered the pest in the late autumn of 1917, and suspecting its identity, submitted specimens to the Federal Department of Agriculture for verification. Upon confirmation of its identity, the department began in the spring of 1918 an investigation of the life history and habits of the pest.

EARLY INFESTATIONS

At the close of 1919, it was known to be present in an area of about 1,000 square miles in the environs of Boston, and on the basis of this knowledge, the entomologists of the country in conference with officials of the department, recognizing the dangerous character of the invader, considered the desirability of requesting a huge Federal appropriation for the purpose of undertaking a campaign of extermination there.

As a result of its experience with other introduced pests, however, the department realized that the corn borer might be, and probably was then, present in other sections of the country and on these grounds, and in the absence of a thorough survey to determine the existing limits of infestation in the United States it declined to approve the initiation of such an extermination project. This action was soon amply justified by the discovery in September, 1919, of a large infestation near Buffalo, at Silver Creek, N. Y. In August, 1920, an area of 1,200 square miles containing a heavy infestation of the corn borer was found in extreme southeastern Ontario, Canada, just south of St. Thomas.

It is now generally recognized that all of these infestations had existed for several years previous to discovery, and there is ample reason for the belief that they began simultaneously with the Massachusetts infestation, although that was the first colony actually to be discovered. It therefore follows that had a large appropriation for exterminative purposes been made and the same expended principally in the Boston, Mass., metropolitan area, as was proposed, this action would have been in vain.

In view of the present efficient port inspection system of the Federal Horticultural Board, the question may be asked how this pest succeeded in evading the vigilance of that agency, but the answer is that this regulatory body was not authorized by law until 1912, or several years subsequent to the probable entry of the corn borer into America.

In February, 1920, the inspectors of this board intercepted at the port of New York a cargo of broomcorn from Italy that was heavily infested with live corn borers, thus practically setting at rest all doubt regarding the origin of the pest and its means of entry to this country.

CONTROL MEASURES ADOPTED

Although the department had firmly opposed an appropriation of several million dollars on a basis of extermination of the insect, which it believed to be a hopeless undertaking, it had, from the very first, recognized the extremely dangerous character of the pest with which it had to deal, and therefore promptly recommended an appropriation of $500,000 for investigative and repressive work, including quarantine measures. Congress approved an appropriation of $250,000, which became available July 24, 1919.

With these funds in hand, the first adequate activities were started. The research work was placed on a suitable basis, the quarantine and scouting operations were organized and the study of the European parasites of the corn borer was begun. The colonization of parasites in eastern Massachusetts followed promptly.

At the close of the growing season of 1920, four well-defined infestations of the borer were known to exist in North America. They were as follows: (1) Along the seaboard of Massachusetts and New Hampshire, (2) in east central New York, (3) in extreme western New York, and (4) in southeastern Ontario along the north shore of Lake Erie. Infestation in the last-mentioned area was of great importance because it existed in a location where much field corn was grown, was severe in character, and possessed great potential danger as a possible source of dispersion of the pest to the nearby States of Ohio and Michigan. Alarmed by the severe character of this infestation, the Canadian Government at once threw a quarantine around its infested district, with the hope of protecting the important Canadian corn-growing counties of Kent and Essex from immediate

infestation. At least 2,400 square miles of the best farming land in the Dominion were known to be infested at this time, and it was by no means certain that the ultimate limits of the area had been defined.

CORN BELT THREATENED

The danger of the Corn Belt involved in this situation was obvious to all concerned, and the department immediately began a surveillance of the southern shore Lake Erie in Ohio and Pennsylvania, to detect the earliest appearance of the corn borer should it reach there. None was found during the fall of 1920 or the spring of 1921, but in August of that year, the worst fears were realized in the discovery, by departmental inspectors, of considerable numbers of the borers on Kellys Island, opposite Sandusky, Ohio. The remaining islands of the Put-in-Bay group, which extend nearly across the lake, were soon found to be infested, and this discovery was quickly followed by the finding of the insect in a thin line all along the lake front from Sandusky to Ashtabula, Ohio, and into Pennsylvania.

The amount of infestation present at that time was so slight that only the most highly trained and vigilant of the scouts could find it, as the number of borers present was considerably less than one borer per 100 stalks of corn. A careful examination of the wind records for the region, made by the United States Weather Bureau, showed that the direction of the prevailing winds during the flight period of the moths in late June and early July, 1921, was such as to carry the insects from Ontario to the American side of Lake Erie. This fact, coupled with the knowledge of the powers of flight possessed by the insect, renders it practically certain that the invasion of Ohio and Michigan by the corn borer originated in Canada, and that the moths flew or were blown from Ontario to the American shore, possibly via the series of islands in the western end of Lake Erie.

FUNDS FOR INVESTIGATION AND CONTROL

The situation at the end of 1921, therefore, indicated that the borer had become permanently established in northern Ohio, western Pennsylvania, and southeastern Michigan, and that the fight against the insect in relation to the Corn Belt was about to begin in earnest. All State agencies concerned were notified of the emergency and steps were taken to begin as comprehensive an education campaign for control as the funds in hand would permit.

The annual Federal appropriations for the prevention of spread of the European corn borer, beginning with the fiscal year 1920, were as follows:

	Amount		Amount
1920	$250,000	1926	$383,000
1921	400,000	1927	485,000
1922	275,000	1928	685,120
1923	200,000		
1924	225,000	Total	3,119,120
1925	216,000		

These funds were provided for research and regulatory work only and were expended principally for quarantine, scouting, and experimental control. No Federal funds for the conduct of general-control operations in connection with this insect were provided until the spring of 1927, as hereafter mentioned.

Although existing educational and regulatory agencies were coordinated in an effort to stem the rising tide of infestation within the Great Lakes corn-borer area, both the extent and the intensity of the infestation increased steadily but rather gradually until the close of 1925 without causing general alarm on the part of the corn growers or business of the infested States.

Toward the close of this period, however, the States had recognized the gravity of the situation by promulgating regulatory laws which required corn growers to clean-up, without compensation, all cornfields, in order to destroy the borers harbored therein.

BORER SPREADS IN CANADA

The character of the infestation in Ontario grew rapidly more grave where, within an area of 400 square miles, losses of the entire corn crop were reported for the season of 1925. This heavy loss and the serious injury to corn generally observed induced many Canadian growers to abandon corn for other crops. Such action resulted in greatly decreased acreages of corn thus concentrating the

infestation of the pest and inducing it to migrate in search of less crowded conditions, which it easily found in the neighboring States of Michigan and Ohio.

In the spring of 1926 the farmers of the former great corn counties of Kent and Essex, in Ontario, planted only 10 per cent of the acreage to corn that had been seeded there in 1923. This action, in combination with weather conditions favorable for the development and migration of the corn borer, undoubtedly caused the moths to rise in still greater numbers and to fly to the American shore, thus causing the enormous increase in infestation that was discovered there in the late summer and fall of 1926.

By this time many fields of corn in Michigan and Ohio along the Lake Shore showed injury from the borer so plainly as to convince both skeptic and optimist alike that a grave crisis confronted the corn growers of this region. In the meantime, the borer had wreaked havoc in Kent and Essex Counties, Ontario, where an area of more than 1,200 square miles was found to contain scarcely a single field of marketable corn. Field after field was to be seen in August, standing brown and stark, or lying ruined on the ground as if trampled by a herd of cattle.

LARGE SCALE CLEAN-UP PROPOSED

As these conditions became known through the agency of the press, public consciousness suddenly awoke to the fact that a serious crisis threatened the Corn Belt. The value of farm lands in the infested areas of the United States had begun to decline, and the attention of bankers and business men was thus directed to the approaching danger. The situation obviously was such as to demand prompt and drastic action if the corn borer was to be prevented from immediately invading the Corn Belt. This condition of affairs led to the organization of a representative body of citizens of the United States and Canada, which adopted the title of the "International Corn-Borer Organization." It met at Detroit, Mich., on September 25, 1926, and appointed an executive committee with power to act.

The general idea of a large scale clean-up campaign originated with this body and it requested the department to outline a plan of attack against the pest. Such a plan was promptly prepared by its control experts and was approved by the executive committee. The personnel of this committee as originally constituted was as follows:

G. I. Cristie, director agricultural experiment station, Purdue University, Lafayette, Ind., chairman.

C. V. Truax, director department of agriculture, Columbus, Ohio, secretary.

C. F. Curtiss, dean and director, division of agriculture, Iowa State College, Ames, Iowa.

L. E. Call, director agricultural experiment station, Kansas State College, Manhatten, Kans.

C. G. Woodbury, director raw products research, National Canners Association, Washington, D. C.

C. F. Norgord, assistant commissioner, department of farms and markets, Albany, N. Y.

Arthur Gibson, Dominion entomologist, department of agriculture, Ottawa, Canada.

Sam Thompson, president American Farm Bureau Federation, Chicago, Ill.

L. J. Taber, master National Grange, Columbus, Ohio.

A. C. Carton, director bureau agricultural industry, department of agriculture. Lansing, Mich.

C. W. Williams, director department of agriculture, Harrisburg, Pa.

Both the State and Federal experts were agreed that although the extermination of the pest was deemed impossible, the proposed campaign should result in repression of the insect and probably in the prevention of commercial loss of the crop. It was also felt that this great operation would have a great educational value in demonstrating the fact that where proper control measures are generally adopted the corn borer can be reduced or held to a minimum and that the general adoption of such measures would permit corn to be grown profitably in spite of the presence of the pest.

FEDERAL AID OBTAINED

In order to cope successfully with the situation, it was agreed that as the pest constituted a national menace, a Federal appropriation of at least $10,000,000 would be required.

The executive committee of the International Corn-Borer Organization presented the matter to the Secretary of Agriculture, the Director of the Bureau of the Budget, and the President, and with their approval, a bill to authorize the appropriation of the required sum was presented to the Congress by Hon. Fred S. Purnell in early January, 1927, and considered by the House Committee on Agriculture on January 5.

It was subsequently passed by Congress and approved by the President, February 9, 1927, and the appropriation, made by joint resolution of the Congress, was approved by the President February 23, 1927. The joint resolution making the appropriation contained the following restriction upon the expenditure thereof:

"*Provided*, That no part of this appropriation shall be expended until all the States in the proposed control area shall have provided necessary regulatory legislation and until a sum or sums adequate in the judgment of the Secretary of Agriculture, to the cooperation of all the States in such area shall have been appropriated, subscribed, or contributed by State, county, or local authorities, or individuals or organizations."

By reason of this proviso, State legislation empowering each State concerned to comply with the provisions of the Federal legislation was essential before the Federal appropriation could become available. For this reason actual initiation of the work was delayed until March 14 following, when the first equipment was purchased and the campaign finally launched.

It was the request of the department that the funds for the conduct of the corn-borer clean-up campaign be made available not later than February 1, 1927, as this date was believed to be the latest upon which the campaign could be started with certain prospects of completion before the moths of the corn borer would begin to emerge in such numbers as to terminate clean-up work for the year. It will be understood therefore that exactly six weeks of this time had already elapsed before the project got under way and that consequently the period available for the conduct of this huge and difficult task was very brief. Because of this, it was necessary to conduct all of the earlier operations at a far higher rate of speed than is usually conducive to efficiency and economy. In spite of this handicap, however, within a very few days a large part of the equipment had been delivered and demonstrations of the methods of control were under way in Ohio and Michigan.

PROCUREMENT OF EQUIPMENT

Prior to entering the market for any equipment, the needs of the department had been presented to the Chief Coordinator, and the possibility of supplying such needs from stocks surplus to other branches of the Government was fully considered. The majority of the equipment covered by the department's list, however, was of a class which rarely, if ever, appears in serviceable condition on lists of Federal surplus property, and it was found that none of it was available at that time, whereupon the Chief Coordinator issued to the department a general clearance to purchase all necessary equipment without reference to Federal surplus stock. With the assistance of the automotive and mechanical engineering forces of the department, the Division of Purchase, Sales, and Traffic drafted and mailed to manufacturers and dealers specifications covering the required items.

Newspaper advertising was not resorted to for the reason that the delay incident thereto would have jeopardized the success of the campaign, but the requirements of section 3709 Revised Statutes as to advertising were fully complied with by expanding the department's mailing lists to cover thoroughly the field of supply. In connection with the principal items of automotive, tractor, and agricultural machinery equipment, bidders were permitted to submit telegraphic bids subsequently confirmed by mail. This shortened the advertising periods, thus affording successful bidders a slightly longer time in which to meet the drastic delivery terms which the department was compelled to impose. To insure to the greatest possible degree uninterrupted operation of this equipment, the specifications also required successful bidders to maintain exceptional servicing facilities throughout the area during the period of the campaign. As rapidly as bids were received and opened they were carefully analyzed by the department's technical officers, with the result that it was possible to make awards and place purchase orders for the majority of the principal items within a few hours after funds finally became available.

The widest competition possible was also secured in connection with the contracts for all gasoline, fuel oil, and lubricants required by the department in the area during the campaign period.

FEDERAL PROVISIONS UNDER WHICH WORK WAS DONE

The general plan under which Federal aid was extended to corn growers under the $10,000,000 appropriation for corn-borer control was adopted upon the recommendation of the International Corn-Borer Committee and was published in detail as Miscellaneous Circular 102, of the United States Department of Agriculture, in February, 1927. The provisions of this plan were in brief that the farmers were to be compensated at a rate not to exceed $2 per acre for extra labor performed by them which was additional to that which is normal and usual in ordinary farm operations. Such compensation in all cases to be provisional upon Federal inspection and approval of the work that was done.

Table 5, appended, presents a detailed account of the total corn acreage inspected, number of farmers' reimbursement vouchers paid, total amount thereof, average amount of reimbursement per acre, and other pertinent information concerning activities in the clean-up area.

ORGANIZATION OF CONTROL WORK

Although the execution of the corn-borer control project was assigned primarily to the Bureau of Entomology of the department, it was obvious that the conduct of this immense campaign would involve requirements far beyond the resources of any one bureau and that if it was to be rendered successful the coordination of all the resources of the department would be necessary. With this in view, Dr. A. F. Woods, director of scientific work for the department, assumed general administrative control, under instructions from the Secretary of Agriculture, with Dr. W. H. Larrimer, senior entomologist in charge of cereal and forage insect investigations, Bureau of Entomology, in direct supervision of the control work. The general supervision of the control operations in the field was assigned to L. H. Worthley, administrative officer in corn-borer control, who had conducted the corn-borer regulatory work since 1919. The control work was supplemented by an educational campaign conducted by the Extension Service of the Department in cooperation with the State agricultural colleges in the corn-borer area.

General headquarters for field control operations were established at 615 Front Street, Toledo, Ohio, on March 15, 1927, where a modern factory building containing approximately 75,000 square feet of floor space was obtained. This property included a railroad spur track and ample acreage of ground close at hand for temporary storage purposes. Here was delivered most of the equipment and machinery required for the prosecution of the work in the western two-thirds of the clean-up territory. Some idea of the dispatch and efficiency with which this phase of the work was handled may be gained from the statement that although 418 carloads of machinery were received in five different States, 252 carloads of this at Toledo alone, demurrage charges were incurred to the extent of but $4 for the entire group of shipments.

The clean-up area was divided into there districts: (1) Western, comprising the clean-up area in western Ohio, Indiana, and Michigan; (2) central, comprising the eastern Ohio clean-up area; and (3) eastern, comprising the clean-up area in Pennsylvania and New York, with district offices at Toledo and Cleveland, Ohio, and Erie, Pa., respectively.

Steps were taken immediately to secure suitable men to act as supervisors, in each county where work was to be done. Six inspectors were appointed for each county to assist the county supervisor in the conduct of the work. Supervisors were assembled at Toledo and Cleveland, Ohio, and Erie, Pennsylvania, for instructions in their duties and the proper procedure to be followed in the clean-up campaign. Similar conferences were held with the educational workers of the State organizations in order that all might obtain a clear understanding of the standards to be set in the requirements as regards the quality of the clean-up work, whether this was done by the farmers themselves or the Government forces. They were given to understand that the general objective was a 100 per cent clean job in all cases. All officers who were to make contact with the farmers were, however, cautioned to use common sense and discretion in applying the regulations as it was the earnest desire of the department to help the farmer to accomplish the desired end and in no case to inflict unnecessary hardship.

CLEAN-UP AREA DETERMINED

The extent of the area to be cleaned up was decided as a result of a conference of the International Corn Borer Committee with Federal departmental officials. It was at first believed that all of the area where the European corn borer has one generation should be included. This would have meant three-fourths of New York, about one-half of Pennsylvania, one-half of Ohio, one-third of Michigan, and six counties in northeastern Indiana. Subsequently, however, it was decided at a similar conference to include all of the infested area in Ohio, Michigan, and Indiana with but five counties in western New York and eight counties in western Pennsylvania, including in all 40,051 square miles. The reason for so radical a reduction in the clean-up area in Pennsylvania and New York was the fact that the infestation in the excluded portion was considered too light to be dangerous, the acreage was not very extensive, and generally speaking corn was not the main crop.

In spite of the fact that it was impossible to announce until March 15, 1927, the terms under which reimbursement for the clean-up work would be made, the response of the corn growers was little short of marvelous. It was announced that they would be given until May 1 following to accomplish the clean-up work on their premises, but that at the expiration of that period the State and Federal Governments would step in and proceed to finish the operation where necessary. It was recognized that, owing to the fact that the farmers had no knowledge of any intended clean-up campaign at the time they had planted their winter wheat in the fall of 1926, many of them had seeded this on corn land. In most of such fields there remained great masses of cornstalks and débris containing thousands upon thousands of corn borers. To overcome this condition, the engineering experts had made available an implement known as the stubble pulverizer. These machines were purchased by the Government to meet the situation previously mentioned and, when operated properly, shredded the standing stubble, thereby destroying the borers contained therein.

VOLUNTARY EFFORTS BY FARMERS

Provision was made in the regulations by which the farmer had the option of securing the use of such machines to aid in cleaning seeded fields on the terms as detailed in Miscellaneous Circular 102. The supervisors were instructed in all cases that under no condition was a stubble pulverizer to be operated on any farm previous to May 16 in the absence of a specific request from the owner or tenant thereof. Many farmers took advantage of this privilege, but on other farms, owing to the late date at which the announcement of the regulations was made, the small grains planted on corn lands had made such advanced growth that the stubble pulverizers could not be operated in them without destroying or seriously damaging the grain. As most of the farms on which this condition prevailed were located in areas where the infestation of the borer was very slight, it was found advisable to exempt such fields from the clean-up regulations to avoid destroying the growing crops.

As the period of voluntary clean-up progressed, it became increasingly evident that a vast majority of the farmers were making extra efforts to comply with the regulations and to put their farms in condition to receive the compensation offered under the Federal law. Whole families were to be seen busily engaged in gathering by every method at their command almost every vestige and shred of corn débris. Men, young an old, women, and even little children participated in the work which became visible by day in columns of smoke and by night in pillars of fire. As time went on, however, it became obvious that because of the almost constant rain and the conditions caused by it, many of the farmers could not possibly finish their work by May 1. In view of this fact, a period of grace was allowed and it was announced that the final date would be extended to May 16.

FEDERAL CLEAN-UP WORK BEGINS

On that date the Federal forces entered upon the second phase of the campaign and undertook to finish the clean-up work where this had not been completed and to conduct the entire operation wherever the corn grower had failed or had refused to do the necessary work.

As under constitutional provisions the Federal Government possesses no police power with respect to intrastate affairs, it was necessary in all cases that the regulatory work conducted throughout this clean-up campaign be prosecuted

under State authority. It should be clearly understood, therefore, that where, for any reason, it became necessary for Federal officers to enter private property for the purpose of enforcing any phase of the clean-up work, this was done under authority conferred by State legislation and with the knowledge and consent of the appropriate officers of the States concerned.

The methods pursued by the Federal forces in the clean-up operations necessarily depended largely upon the prevailing condition of the land to be cleaned. They consisted in general, however, of plowing cleanly, destruction of stubble with pulverizers, burning both standing or prostrate stalks, stubble, and débris by means of especially designed high-power burners, and of hand labor, such as raking and burning, picking up and gathering in baskets or otherwise, of all dangerous corn remnants in fields, about farm buildings, feed lots, barnyards, or wherever existing, and their destruction by burning. Much of the most arduous and costly labor was performed by what were termed "scavenger crews" who followed, where necessary, all types of clean-up operations, gathering and burning every vestige of corn débris remaining upon the surface of the soil. In order to attain the perfectly clean conditions which were a requisite of the compaign, it was necessary in some cases to have this gleaning process repeated again and again until the fields were rendered as clean as was humanly possible.

Although the attitude of the farmers toward the entire campaign, in the vast majority of cases, was most satisfactory, there were some exceptions which caused the department momentary embarrassment.

Machine burning operations were conducted only as a last resort, where more economical methods would not be applied and where infestation of a dangerous character was known to exist. It should be understood, however, that where burning of this character was done, it resulted in the destruction of practically 100 per cent of the insects. This method was especially valuable in cases of extreme infestation which could not be treated otherwise.

Fortunately for the conduct of the clean-up work, the temperature during June remained unseasonably low throughout the clean-up area. Thus, although the wet, stormy conditions previously experienced in the work presented unusual difficulties, these were partly compensated by the deficiencies in temperature occurring in June and which served to delay the appearance of the corn-borer moths and on this account permitted the continuance of the clean-up work for at least a week longer than would have been possible in a normal season. Toward the close of June, however, the moths emerged in such numbers as to render the continuation of the work inadvisable, and on July 2 compulsory clean-up activities were brought to an end.

Number of square miles and number of counties in the 1927 spring clean-up area

State	Square miles	Counties
Ohio	16,843	[1] 34 [2] 8
Indiana	1,163	[1] 4 [2] 2
Michigan	15,099	[1] 20 [2] 3
Pennsylvania	5,661	[1] 8
New York	1,285	[2] 3
Total square miles	40,051	
Total number of counties affected		82

[1] Entire. [2] Fractional parts of.

ENGINEERING AND MAINTENANCE OF EQUIPMENT

Before operations began in the field a great deal of work was necessary to analyze conditions to be met, to estimate the quantities and types of equipment that would be necessary, and to determine what supplies, accessories, and other details must be arranged for to render a smooth-running, efficient organization.

The following major equipment was purchased (see also Table No. 4):

Three hundred and sixty 9–18-horsepower tractors, pulling 1–18-inch plow; four hundred and forty 15–30-horsepower tractors and four hundred and forty 15–27-horsepower tractors, pulling 2 or 3 bottom 16-inch plow or stubble pulverizer.

Four hundred and fifty 18-inch plows (single bottom), and, three hundred and twenty four 16-inch plows (3 bottom), especially adaptable for turning under completely stalks left standing. Gang plows used in the large areas.

Eight hundred stubble pulverizers (machines having revolving blades especially constructed to the destruction of corn stubble up to 10 inches high).

Sixty-four heavy-duty oil-pumping apparatus, for feeding burner carriages with fuel oil under high pressure.

Sixty-four 5-ton trailers with 1,000-gallon tanks, to supply pumping apparatus with fuel oil.

Fifteen 1,000-gallon tank trucks, for supplying pumping apparatus with fuel oil.

One hundred 3½-ton trucks, for moving farm machinery and equipment.

Fifty 600-gallon tank trucks, for supplying tractors with gasoline.

Two hundred burner carriages, to be used with heavy-duty oil pumps for field burning; 103,500 feet one-half inch oil hose, to carry fuel oil from pumps to burners; 1,875 feet 1-inch oil hose, to supply hose from tanks to burners; 34,500 feet ¾-inch, oil hose, to act as main supply base where branches are operated; 1,875 feet 2½-inch suction hose.

Twenty-five 2-wheel trailers, for transporting plows and stubble pulverizers and to serve as tractor loading skid.

Seventy-five 1-ton trucks for transporting supplies and light farm machinery equipment.

Nine 5-passenger sedans, for administrative officials.

Seventy-five 2-passenger coupes, for county and district supervisors and service overseers.

Four hundred and sixty-four ½-ton trucks with slip-on bodies, for inspectors and check-up men transporting small supplies and tools.

One hundred 1-ton canopy trucks, for transporting men and tools engaged in pick-up and burning work.

Forty-four ½-ton 6-poster trucks, for transporting men and pile-burning crews with tools.

REASONS FOR SIZES AND TYPES OF EQUIPMENT SPECIFIED

It was very evident that much of the corn acreage which was to be cleaned up in the spring of 1927 could be handled best by an implement known as the stubble pulverizer. Inasmuch as the power of a 3-plow tractor is necessary to insure the proper running of this implement in hilly country and under soft or rough ground conditions, tractors of 15 to 27 horsepower, as a minimum, were specified for use with it. These tractors were to be used also for plowing; gang plows having slightly wider bottoms than normal were deemed advisable because of the belief then prevalent that the wider bottom plows turn trash under better than the 12-inch and 14-inch sizes. Hence, to insure an efficient use of power, labor, and time, 2 to 3 bottom, 16-inch gang plows were secured for use with the large tractors. The plows were constructed so as to permit the third bottom to be detached quickly in case conditions were met where three bottoms proved to be too great a load.

Inasmuch as considerable plowing would have to be done in small fields and in circumstances under which it seemed probable that objection would be made to the use of larger tractors, single-bottom plows were also purchased. These were of the 18-inch size and required a complement of 9–18 horsepower tractors for operation.

The field burners specified were of the only size and type which experience of several years in insect control had shown successful for the purpose. Truck equipment to transport tractors, plows, and pulverizers, tank trucks to haul fuel oil to burners, tank trucks to keep the field units supplied, and the automobile equipment were all specified in numbers, sizes and types according to the weights and quantities to be hauled, according to distances, according to the conditions to be met, or according to specific purposes and requirements.

CARE EXERCISED IN WRITING SPECIFICATIONS

The agricultural engineers who assisted in the preparation of the original plan and estimate, together with the engineers of the Bureau of Public Roads, assisted the division of purchases and sales of the department in preparing the specifications and public proposals for equipment. In writing the specifications and in making awards great care was exercised to secure stock models of proven worth, durability, accessibility of repairs and service, and reliability in manufacture.

ESTABLISHMENT OF ENGINEERING BRANCH

As soon as operations began at the Toledo control headquarters, March 15, 1927, a division of engineering and maintenance was established in the main office. This branch was represented in each district office by a service overseer. Inasmuch as the actual field operations in this clean-up project were largely those of agricultural engineering, and as some two million dollars worth of equipment was purchased to accomplish the clean-up over an area comprising about two and one-half million acres of corn land, the responsibilities of the engineering department were grave and the task of organizing and managing the maintenance of that equipment was an arduous one.

Awards for equipment were ready and immediately upon the release of funds on March 14, 1927, many awards were made by telegram. The equipment began arriving at Toledo and the other five receiving points four or five days later in such great quantities that some difficulty was experienced in handling it because no organization for this purpose could be assembled prior to March 14. By careful management, however, and by remarkable expediency, all equipment was unloaded promptly, and its removal into the field was begun at once.

The field operation branch in each district office was responsible for allotting the equipment to the various counties as units, and throughout the season the operating branch was responsible for shifting the field units from county to county as conditions demanded. In short, this branch was responsible for keeping the equipment at work; the engineering and maintenance division was responsible for keeping it in working condition. The latter division also assisted in laying down general policies affecting the allotment of equipment according to adaptability to specific local conditions; it assisted in the institution and management of the supply lines; it specified the oils and fuels to be used, and it shared in the responsibility of instruction and management of operators.

SERVICING FIELD EQUIPMENT

The servicing of all mechanical equipment in each district was under the direct control of the service overseer for that district. The service overseer was responsible directly to the head of the engineering and maintenance division located in the main office at Toledo. Each service overseer had under him service men equipped with one-half-ton trucks, tools, supplies, and repair parts, the number of these men in each district varying according to the requirements of the district. Specific territory was allotted to each service man who continually traversed his territory coming in contact as frequently as possible with all Government corn-borer equipment in that territory. Upon making contact with such equipment, he inspected it, tuned it up, did all the repair work necessary, observed the treatment being given the units, and instructed the operators in the care, use, and operation of such equipment. Each service man was assigned a central station within his territory to which he reported at frequent intervals either in person or by telephone. In this way he was quickly accessible and could be directed to the location of trouble and breakdowns.

The service overseers kept in contact personally with their service men, instructing them, weeding out the less efficient ones, and getting first-hand information on the common troubles experienced. In this way the system was being continually improved. The service overseer was supplied with sufficient help in each district office to enable him to keep the right number and proper types of repair parts and other necessary supplies moving smoothly to his service men in the field.

SPECIAL INSTRUCTION

Schools of instruction on the adjustment, care, and operation of the mechanical equipment were held for drivers, field operators, service men, and crew foremen. Special letters of instruction on similar matters were sent out from time to time. During the plowing season, special field equipment instructors were placed in the field to check up on the quality of plowing that was being done and to instruct all operators on the absolute necessity of clean plowing in the campaign and on how to obtain it.

PERFORMANCE OF MAJOR TYPES OF EQUIPMENT

The stubble pulverizers were found a very valuable asset when used for the conditions for which the implement is designed. It was found, however, that it is not always a safe control unit when used on stubble over 10 inches in height,

and in its present state of development it should not be used on whole stalks where the primary purpose is to kill larvae within the stalks. The repair cost of the implement ran rather high, especially when the pulverizer was used in stony fields; but this was due to the severe external conditions which the machine must meet rather than to any serious inherent weaknesses. The use of pulverizers in the spring clean-up was essential, and the experience gained has furnished suggestions for improvement in both design and use.

Some unfavorable comment was evoked by the fact that while arrangements were made to supply farmers with stubble pulverizers for use in the campaign, similar arrangements were not made in the case of plows. This arrangement was made, however, for the reason that while the stubble pulverizer is a new implement especially designed for use in the campaign, the plow is part of the regular equipment of the farm which is indispensable in the culture of nearly all crops.

Most of the special plows purchased gave excellent satisfaction under good plowing conditions, but where the ground is hard and comes up in large clods, there is some question as to the effectiveness of the plowing method; trash may be turned under completely, but its exposure between the clods under these conditions remains a menace from the standpoint of control. The gang plows showed weaknesses in materials and construction at two or three points in design; consequently the repair cost on shares ran rather high, excluding the fact that frequent loading and unloading increased wear and tear. The failure of the manufacturer of these gangs to supply an adequate stock of repair parts within the infested region handicapped the work when the plowing season first opened.

The performance of the large tractors, purchased for use with the stubble pulverizers and gang plows, was very satisfactory. Any weaknesses which developed were corrected immediately by the manufacturers at their own expense. The smaller tractors were used only with the sulky plows and for this purpose proved their value.

Burning operations by use of the field burners were confined to the highly infested areas. In emergencies, burning was a very essential method for serious conditions which had to be handled quickly. Although the burning method is one of the most expensive means, of course, it is the most effective method when properly done. The field burners, which are of a special design for corn borer control work, together with the tank trailers, gave excellent satisfaction, though the extremely wet conditions which prevailed during the clean-up period made the burning operations much more expensive than usual. It is believed that considerable improvement is possible both in the burning nozzles and burning carriages.

One-half of the total number of 3½-ton, stake-body trucks, and all of the 1-ton stake-body trucks were purchased from one manufacturer marketing a standard product. These trucks have proved a very valuable and wise investment; their performance has been excellent. The remainder of the 3½-ton trucks and all of the tank trucks were purchased from another manufacturer who was the low bidder. These latter products, especially the stake-body jobs, have been extremely troublesome, the program has been handicapped by the failure of this equipment, and it is now being completely reconditioned by the manufacturer.

With the exception of a very few major difficulties which the manufacturers in most cases adjusted at their own expense, and a few minor troubles, the light truck equipment, light cars, and carryalls gave excellent satisfaction and proved of right size and type.

IMPROVEMENTS SOUGHT

Throughout the season the engineering division followed closely the adaptibility of the various types of equipment in an endeavor to find ways and means of improving procedure, to find opportunity for improvement in design, and to turn the experiences and lessons of the campaign into capital for subsequent use. Many suggestions were offered from various sources, and in case these were of mechanical control nature, they were considered and in many cases investigated. Several farmers made clever, home-made devices to assist in the clean-up of their fields. The organization was instructed to watch for such ideas and as these came to the attention of the supervising officials, they were recorded, and they either have been or will be fully investigated.

COOPERATION IN DEVELOPMENT WORK

Another function of the engineering and maintenance division has been cooperative effort with the colleges, experiment stations, manufacturers, and other agencies interested, in the development of new, more efficient devices for

mechanical control; in the improvement of existing devices, and in securing information of educational value to the farmer on clean-up procedure. As a result of this cooperative effort, and owing to the admirable support given by implement manufacturers to the control of the corn borer, great progress has been made on low-cutting attachments for corn binders. The field ensilage cutter has been improved from the standpoint of control, special corn-borer plows are available, special attachments for plows are being developed, small burning machines are being experimented with, and a combination corn harvester has been built. Attachments for application to corn pickers are being developed to enable the farmer to pick his corn and destroy the borer in one operation, and a mass of information of value to the farmer has been assembled.

EQUIPMENT IN DEMONSTRATIONS

In regular, organized demonstration work in which corn-borer equipment was used, the demonstrations were arranged for by the educational branch and the equipment was furnished, controlled, and operated by the operating branch. The responsibility of controlling, operating, and maintaining such equipment belongs to the engineering and maintenance branch. By such cooperative arrangement between the educational and operating branches, approximately 200 demonstrations are being given during the fall of 1927 with low-cutting attachments on corn binders.

STORAGE AND RECONDITIONING OF EQUIPMENT

A few units of automotive equipment are stored for the winter at the regular supply stations located at Howell, Mich., and Elyria, Ohio. Most of the tractors and plows used in New York and Pennsylvania are stored at the corn-borer station in Meadville, Pa. As much automotive equipment at present is stored and reconditioned at Toledo as the warehouse there will accommodate. All other equipment, practically three quarters of the total, has been stored and is being reconditioned at the Erie ordnance reserve depot, Lacarne, Ohio, where the War Department has allotted the Department of Agriculture over 200,000 square feet of covered floor space for this purpose. The depot there affords excellent shop facilities, and the equipment is now being put through a regular production system of repair and reconditioning under the management of a member of the engineering and maintenance department. This procedure will result in the saving of a large sum for rentals and repair work.

The Department of Agriculture is indebted to the War Department for this cooperation which permits the corn-borer equipment being cared for in the safest and most economical manner.

EDUCATIONAL ACTIVITIES

At the outset of the campaign the department extension service, C. W. Warburton, director, was called on to organize the educational activities of the campaign in cooperation with the State agricultural colleges in the infested area. Previous experience in the control of serious plant and animal pests showed the necessity of securing the whole-hearted cooperation of the public, particularly the farmers. People generally do not like to be forced to do something; however, the majority of them, when fully informed of the facts, are willing cooperators. Realizing this, it was believed best to precede the regulatory work with a thorough and far-reaching educational campaign in those portions of the States of New York, Pennsylvania, Ohio, Michigan, and Indiana where the regulatory quarantine was established.

Following a preliminary conference in Washington on February 26, 1927, which was attended by the directors of extension of the States involved, plans were carried out whereby the cooperative extension service of the department and the State agricultural colleges, with such additional emergency personnel as was deemed necessary, put on an intensive educational campaign up to the time regulatory measures went into effect on May 1. Owing to unfavorable field conditions, the period for intensive educational work was extended to May 16.

The educational activities were carried out under the general supervision of C. B. Smith, chief, office of cooperative extension work, which office represents the department extension service in its relations with the directors of extension at the State agricultural colleges. G. E. F. Farrell, in charge extension work,

Central States, and Reuben Brigham, in charge visual instruction and editorial work, were designated to represent the office of cooperative extension work in handling respectively the educational and informational phases of the campaign.

The educational work was carried on by county agricultural agents and assistant agents in the 82 counties in the clean-up area. Demonstrations in control methods at field meetings, automobile tours by farmers to heavily infested fields, and illustrated talks at community meetings were some of the methods used to call the attention of farmers to control measures. Bulletins, circulars, posters, motion pictures, lantern slides, and exhibits were also freely used. News of the progress of the campaign and information regarding control measures was supplied regularly to all weekly and daily newspapers in the area. A news picture service on control activities was one of the features of the service to the newspaper. Throughout the educational campaign the county extension agents were assisted by a force of regular and emergency specialists in agricultural engineering, entomology, and agronomy and by the extension editors and their assistants in the various States. Much of the success of the campaign as a whole can be credited to the intensive educational effort of the county extension agents and the cooperative extension organization in the infested area.

The following table summarizes the various means used by the cooperative extension service to instruct farmers in their voluntary efforts to control the borer:

Summary of means used by cooperative extension service

	New York	Ohio	Michigan	Indiana	Pennsylvania	Total
County, community, or township corn-borer committee appointed	44	116	28	----------	----------	188
Number of members	53	653	266	----------	1,183	2,155
Conferences with county or township corn-borer committees	50	156	69	13	----------	288
Attendance	64	2,404	604	90	----------	2,558
Demonstration meetings held	33	259	133	22	8	455
Attendance	1,626	15,790	21,281	936	----------	39,633
Other corn-borer meetings	108	419	137	25	181	870
Attendance	3,407	36,713	11,885	1,584	5,243	58,832
Meetings at which motion pictures were shown	28	118	44	10	----------	200
Meetings at which lantern slides were shown	19	141	43	9	41	253
Meetings at which charts were used	44	150	16	15	----------	225
Press articles prepared	74	1,234	233	70	126	1,737
Bulletins distributed	11,211	32,365	13,461	10,215	----------	67,252
Circular letters written	50	1,115	43	13	44	1,265
Copies of circular letters mailed	26,970	156,617	14,193	6,499	34,859	239,138
Posters distributed	680	22,479	1,601	1,030	1,706	27,496
Window displays made	21	371	60	0	0	452
Farm visits made	1,577	2,829	1,919	928	[1] 1,086	8,339
Farmers calling at office	160	12,618	2,029	1,305	[1] 369	16,481
Telephone calls made	99	5,917	2,501	456	----------	8,983
Official letters written	286	3,014	648	163	----------	4,111
Miles traveled on official work	18,091	51,487	24,285	9,504	----------	103,367
Farmers signing corn-borer pledge cards	3,963	0	0	0	4,139	8,102

[1] Estimated.

CAMPAIGN RESULTS

In any consideration of the results attained through the conduct of this clean-up campaign, the fact should be kept clearly in mind that its objective was that of repression and not the eradication or extermination of the pest. The complete extermination of this dangerous insect would of course be most desirable could such an end be achieved, but the fundamental requirement of such an attempt would be the conversion of thousands of square miles of fine farming land to the state of a desert, and this without probability of successful results. The objects of the campaign, therefore, were the repression of the borer to a point where it would be so reduced in numbers as to be unable to inflict serious injury to the crop, the prevention of spread where possible, and the demonstration on a large scale of the fact that the control of the pest is feasible through the modification of ordinary farm practices.

At the beginning of the European corn-borer clean-up campaign on March 14, 1927, serious commercial loss from the work of the pest had begun to appear. In northwestern Ohio and southeastern Michigan there were some fields in which the estimated crop loss for 1926 ranged from 25 to 40 per cent of the usual crop. This loss was, however, confined to a small area, thus indicating that it was but the beginning of similar losses certain to be felt subsequently in larger areas as the increase in rate of infestation progressed. Similar loss of the field-corn crop in the summer of 1926 was observed in a small area in western New York, centering about Silver Creek, immediately south of the city of Buffalo. Here the loss was estimated as 25 per cent of the usual crop. A loss in sweet corn for canning of the same extent was experienced in this same district during that summer. These increasing losses rendered it clearly evident that unless the clean-up campaign was successful in reducing the rate of multiplication usual to this pest, it would inevitably inflict widespread and serious damage to the corn crop in a considerable part of the Lake Region during the season of 1927.

SURVEY SHOWS CLEAN-UP EFFECTIVE

The annual critical survey to determine the rate of infestation existing throughout the Lake region had shown at the end of 1926 that there were nearly four times as many borers present than was the case at the close of 1925. At the close of 1926 it was determined by means of this survey, which is based on an examination each year of the same or near-by fields in each locality, that the number of borers existing in each one hundred corn plants was approximately nine. An exactly similar survey conducted after the clean-up work was finished in 1927 revealed the fact that at the close of that growing season there existed within the limits of the clean-up area about 14 borers per 100 plants, which is an increase of less than twofold.

As a result of nearly nine years of research work on the corn borer, it has been determined that the normal potential rate of increase of this insect in average years is about thirtyfold. This means, for instance, that where five borers are left alive in a given field they may multiply so as to produce 150 borers in a single season, or an increase of thirtyfold. The 1927 survey previously referred to showed unmistakably, however, that a marked decrease in rate of multiplication was recorded throughout the clean-up area. In New York there was recorded an actual reduction in the number of borers present from 12 borers per 100 stalks in 1926 to 10 per 100 stalks in 1927. In Ohio there also occurred a decrease of from 6 borers per 100 stalks in 1926 to 5 per 100 stalks in 1927. In Michigan an increase was recorded, there being 27 borers per 100 stalks in 1927 as compared with 12 in 1926, and in Pennsylvania 24 borers per 100 stalks as compared with 7 in 1926. None of the counties in Indiana was included in the survey, as the infestation there is less than 1 borer per 100 stalks.

That this general reduction in the rate of multiplication throughout the entire area was not owing to unfavorable weather conditions is conclusively shown by the results of large-scale field experiments to determine the rate of survival of the young borers and which have been conducted for several years, including the season of 1927. These investigations show that the rate of survival of the young borers in 1927 was more than twice as great as was the case in the previous two years. It is known also that the unusually moist conditions which prevailed during April and May, 1927, were especially favorable to the development of the corn-borer caterpillar. In spite of these unusually favorable conditions for the multiplication of the borer, it should be remarked that no appreciable commercial loss to the corn crop occurred during the summer of 1927 throughout the entire area in which the clean-up was conducted. It therefore is obvious that the marked decrease in multiplication and the general improvement in corn-borer conditions recorded throughout the clean-up area at the close of the growing season of 1927 must be attributed principally, if not entirely, to the clean-up campaign.

CAMPAIGN COMMENDED

This view of the matter is taken by the International Corn-Borer Organization in the report of its executive committee submitted at Detroit, Mich., September 23, 1927, the committee reporting as follows:

"After due consideration of the data presented and after observing conditions, it is the judgment of the committee that the campaign has been successful and has accomplished as far as is humanly possible the object set out to accomplish."

A joint committee of scientists consisting of members from the American Association of Economic Entomologists and American Society of Agronomy and the American Society of Agricultural Engineers, who also met at Detroit on September 23, 1927, presented a report containing the following statement:

"The committee of entomologists, agronomists, and agricultural engineers cooperating wishes to indorse and to give its hearty approval to the efforts that have been made to control the corn borer and to commend those engaged in directing the research, regulatory, and extension activities designed for its control. Especial commendation is given to the farmers who cooperated so splendidly in the clean-up campaign. It is believed that the compulsory clean-up of 1927 not only greatly reduced the rate of infestation increase but has been successful in preventing serious commercial losses, and that the expenditure of large funds for this purpose has been completely justified."

DEPARTMENT PLANS FOR CONTROLLING THE BORER IN 1928

The immediate clean-up of 15,000 acres of bottom lands along rivers leading out of corn-borer territory to prevent long-distance spread of the borer is the first objective in the plans of the department for controlling the borer in 1928. In accomplishing this clean-up of river bottom acreage, reimbursement will be made to the farmers involved who conduct a satisfactory voluntary clean-up. The reimbursement will be at the rate of not to exceed $2 per acre.

This action is in line with the policy the department has adopted in regard to further corn-borer control activities, which is to concentrate the department's effort on the prevention of long-distance spread of the borer, leaving to the State governments in infested territory the responsibility of holding down the increase in the number of borers below serious commercial damage. The department's plans for the prevention of long-distance spread of the borer in addition to the immediate clean-up of river bottom lands include cooperation with the States in scouting to discover infestations in new territory, in the maintenance of strict quarantines to prevent the spread of the borer by human agencies, and in obtaining a thorough clean-up of infested corn acreage on a non-reimbursement basis to farmers during the spring of 1928.

SERIOUS DAMAGE CAN BE PREVENTED

It is the opinion of the department experts that serious commercial injury by the corn borer can be largely prevented if farmers will adhere to the low-cutting, clean plowing, poling, raking, and burning methods of control. It is considered that this work will not involve much extra expense other than that which the farmers would need to incur for their own protection.

The Federal cooperation with the State regulatory officials, which is planned, will be financed by the use of the remainder of the special appropriation of 1927, together with funds available from the States. The department estimates that a compulsory clean-up of 20 per cent of the total corn acreage in the more heavily infested portion of the area cleaned up last spring will be necessary after farmers have accomplished as much as they can through voluntary control measures.

Following July 1, 1928, it is expected that infested States will take full responsibility for necessary regulatory measures, the department concentrating its efforts on scouting and quarantine activities essential to preventing long distance spread of the borer. As a part of its regular work, the department, in cooperation with the State agricultural colleges and experiment stations, has organized a comprehensive program for investigation and education relating to corn-borer control, which will be followed up vigorously. The investigational work includes studies of the life history, habits, and relation of the borer to environment, the breeding of varieties of corn adapted to corn-borer conditions, the development of parasites of the borer, research in the use of different fertilizers, and the improvement of machinery for mechanical control.

The educational work will be carried on as a part of the activities of the cooperative extension service of the department and the State agricultural colleges. These educational activities will include public demonstrations in effective mechanical control methods such as plowing under, burning and low cutting of standing stalks, illustrated talks at community meetings, observation tours by farmers into heavily-infested areas, bulletins, and circulars on control methods, and new items on the progress being made by the farmers and cooperating agencies in meeting the advance of the borer.

TABLE 1.—*Statement of expenditures prior to November 1, 1927, under appropriation "European corn borer control, 1927–28"*

Personal services (see also Table 2):		
Salaries in Washington	$46, 370. 09	
Salaries in the field	214, 274. 83	
Wages (inspectors, foremen, laborers, etc.)	1, 057, 384. 13	
		$1, 318, 029. 05
Supplies and materials:		
Stationery and office supplies	36, 480. 72	
Medical and hospital supplies	53. 20	
Scientific and educational supplies	11, 557. 34	
Fuel (coal)	360. 93	
Fuel oil	129, 286. 39	
Gasoline (motor)	114, 090. 83	
Sundry supplies (ice, signs, waste)	8, 028. 68	
Lubricants (oil and grease)	29, 594. 86	
Materials (lumber, paint, etc.)	11, 270. 03	
		340, 722. 98
Communication service:		
Telegraph service	1, 083. 72	
Telephone service	5, 034. 76	
Other communication service (registration fees, post-office box rent)	76. 37	
		6, 194. 85
Travel expenses:		
Travel expenses (transportation)	40, 139. 94	
Travel expenses (subsistence)	64, 923. 08	
		105, 063. 02
Transportation of things		15, 069. 13
Printing and photographing:		
Printing and binding	$5, 043. 13	
Photographing and making photographs	4, 634. 24	
		9, 677. 37
Storage motor vehicles		2, 742. 08
Advertising and publication of notices		2. 40
Heat, light, power, water, and electricity		1, 570. 53
Rents:		
Rent of buildings and structures	$13, 568. 18	
Other rents (land, equipment, etc.)	931. 05	
		14, 499. 23
Repairs and alterations to buildings and machinery		50, 474. 96
Miscellaneous expenses		71. 90
Reimbursement to farmers (see also Table 3)		4, 213, 990. 46
Equipment (see also Table 4):		
Furniture, furnishings, and fixtures	$24, 119. 26	
Educational and scientific equipment	2, 090. 80	
Passenger-carrying vehicles	52, 050. 00	
Plows	48, 394. 30	
Stubble pulverizers	102, 202. 50	
Oil-burning apparatus	481, 552. 00	
Burning carriages	21, 890. 00	
Oil hose	61, 951. 34	
Tractors	740, 460. 92	
Trucks	632, 740. 54	
Tank trucks	119, 280. 67	
Platform trailers	7, 377. 75	
Tank trailers	44, 446. 72	
Other equipment	43, 965. 05	
		2, 582, 521. 85
Total expenditures		8, 460, 629. 81
Balance unexpended Oct. 31, 1927		1, 539, 370. 19
Total appropriation		10, 000, 000. 00

TABLE 2.—*List of employees under appointment in Washington and in the field for the period March 14, 1927, to October 31, 1927, inclusive*

	Number	Salary rate	Period	
			Mos.	*Days*
Departmental service:				
Salaries—				
Professional service—				
Grade 5, $5,200 to $6,000; average $5,600—				
Senior agriculturist	1	$5,200	7	15
Grade 4, $3,800 to $5,000; average $4,400—				
Agriculturist	1	4,200	7	15
Clerical, administrative, and fiscal service—				
Grade II, $3,800 to $5,000; average $4,400—				
Administrative officer	1	3,800	7	15
Special assistant	1	3,800		5½
Grade 10, $3,300 to $3,900; average $3,600—				
Junior administrative officer	1	3,300	7	16
Grade 9, $3,000 to $3,600; average $3,300—				
Senior adminstrative assistant	1	3,500	2	
Grade 8, $2,700 to $3,300; average $3,000—				
Administrative assistant	1	3,200	2	
Grade 6, $2,100 to $2,700; average $2,400—				
Principal clerk	1	2,500	2	
Grade 5, $1,860 to $2,400; average $2,111.42—				
Senior clerk	1	2,000	2	
Senior clerk-stenographer	1	2,200	1	15
Principal clerk	1	2,200	4	
Senior clerk	1	1,860	3	17
Do	1	1,860	2	12½
Grade 4, $1,680 to $2,040; average $1,680—				
Clerk	1	2,040	2	
Clerk-stenographer	1	1,800	7	15
Photographer	1	1,680	3	15
Clerk	1	1,680	3	12
Grade 3, $1,500 to $1,860; average $1,680—				
Assistant clerk	1	1,860	4	3
Do	1	1,680	3	15
Do	1	1,560	4	2
Do	2	1,500	4	
Do	1	1,500	3	5½
Do	1	1,590	2	5
Assistant photographer	1	1,500	3	
Senior stenographer	1	1,500	2	27
Do	1	1,500	4	27½
Do	2	1,500	3	
Do	1	1,500	2	26
Do	1	1,500	1	3½
Do	1	1,500	1	13
Do	1	1,500	1	4
Do	1	1,500	1	5
Assistant clerk-stenographer	1	1,500	3	4
Do	1	1,500	3	16
Do	1	1,500	2	18½
Do	1	1,500		10
Do	1	1,500	3	6½
Do	1	1,500	1	10
Do	1	1,500	3	8
Do	1	1,500	7	20
Do	1	1,500	3	6
Do	1	1,500	7	9
Senior operator	1	1,500	1	20
Do	1	1,500	1	
Do	1	1,500	3	4
Do	1	1,500	3	3
Do	1	1,500	3	1
Grade 2, $1,320 to $1,680; average, $1,500—				
Junior stenographer	1	1,320	1	
Do	1	1,320	2	26
Do	1	1,320	2	23
Senior typist	4	1,320	3	
Do	1	1,320	2	15½
Do	1	1,320	1	27
Do	1	1,320	4	27½
Do	1	1,320	2	9
Do	1	1,320		23
Do	1	1,320	1	27
Do	1	1,320	2	29
Do	3	1,320	3	22
Do	2	1,320	2	7
Do	1	1,320	2	8
Do	1	1,320	2	28½
Do	1	1,320	2	5
Do	1	1,320		2
Do	1	1,320	2	29½
Do	1	1,320	1	11½

TABLE 2.—*List of employees under appointment in Washington and in the field for the period March 14, 1927, to October 31, 1927, inclusive*—Continued

	Number	Salary rate	Period	
			Mos.	*Days*
Departmental service—Continued.				
Salaries—Continued.				
Clerical, administrative, and fiscal service—Continued.				
Grade 2, $1,320 to $1,680; average $1,500—Continued.				
Senior typist	1	$1,320	2	28
Do	1	1,320	1	29½
Do	1	1,320	4	6
Do	1	1,320		6
Do	1	1,320	2	13½
Junior clerk-typist	1	1,320	3	20
Do	1	1,320	3	4
Do	1	1,320	2	9
Do	1	1,320		4
Do	1	1,320	2	1
Do	2	1,320	3	6
Do	1	1,320		1
Do	1	1,320	3	
Do	1	1,320	1	3
Do	1	1,320	1	1
Do	1	1,320	3	3½
Do	1	1,320	2	28
Do	1	1,320	3	2
Do	1	1,320		16
Junior clerk	1	1,440	3	22
Do	1	1,320	3	9
Do	1	1,320	2	29
Do	1	1,320	1	27
Do	1	1,320	3	3
Do	1	1,320	3	23
Do	1	1,320	3	2
Do	1	1,320	3	6
Do	1	1,320	3	4
Do	1	1,320	3	10
Grade 1, $1,140 to $1,500; average, $1,345—				
Underoperative	1	1,200	3	3
Underclerk	1	1,140		15
Custodial service—				
Grade 5, $1,020 to $1,260 average, $1,140—				
Messenger	1	1,020	6	15
Do	1	1,020	3	15
Do	1	1,020	3	14
Senior laborer	1	1,020	3	13
Grade 2, $900 to $1,140; average, $1,020—				
Junior laborer	1	900	1	26
Assistant messenger	1	900		6
Do	1	900	3	15
Grade 1, $600 to $780; average, $690—				
Junior messenger	1	780	1	6
Do	1	600		6
Do	1	600	6	10
Total salaries, departmental service	------	46,370.09	------	
Field service:				
Salaries and wages—				
Professional service (arranged by salary rates)—				
Agent (agricultural engineer)	1	6,000	6	15
Extension engineer	1	3,600	1	
Do	1	3,600	5	
Entomologist	1	3,600	4	
Extension engineer	1	3,600	1	3
Do	1	3,600	1	10
Extension entomologist	1	3,600	1	8
Extension engineer	1	3,600	2	1
Agent (mechanical engineer)	1	3,400	5	29
Associate entomologist	1	3,400	7	15
Agent (mechanical engineer)	1	3,300	7	15
Do	1	3,300	2	
Associate entomologist	1	3,000	7	15
Agent (mechanical engineer)	1	3,000	2	
Agricultural engineer	1	3,000	1	11
Extension engineer	1	3,000	1	8
Do	1	3,000	3	15
Do	1	3,000		22
Chief aid	1	2,800	7	15
Agent (mechanical engineer)	1	2,800	7	
Do	1	2,800	1	
Do	1	2,800	3	29
Do	1	2,800	4	26
Do	1	2,800	1	29
Do	1	2,800	3	10
Do	1	2,800	1	21

TABLE 2.—*List of employees under appointment in Washington and in the field for the period March 14, 1927, to October 31, 1927, inclusive*—Continued

	Number	Salary rate	Period	
			Mos.	*Days*
Field service—Continued.				
Salaries and wages—Continued.				
Professional service (arranged by salary rates)—Continued.				
Specialist	1	$2,700	3	11
Extension engineer	2	2,700	2	16
Do	1	2,700	1	12
Extension entomologist	1	2,700	3	15
Extension agronomist	1	2,640	1	4
Principal aid	3	2,500	7	15
Extension engineer	1	2,400	1	
Do	1	2,400	2	25
Do	1	2,400	1	8
Assistant extension entomologist	1	2,400	1	15
Extension engineer	1	2,280	3	
Agent (mechanical engineer)	1	2,000	3	
Agent (agricultural engineer)	1	1,500	1	
Extension engineer	2	1,200	1	7
Administrative and field workers—				
Executive officer	1	6,000	7	15
Senior administrator	1	5,200	5	29
Assistant county agent leader	1	4,800	3	18
District agent	1	4,500		52
Extension leader	1	4,200	3	8
Do	1	4,020	3	15
Do	1	3,720	7	10
Do	1	3,000	4	
Do	1	2,100	2	15
State leader (extension)	1	3,600	2	
Administrative officer	2	4,000	7	15
Do	1	3,000	7	12
Junior administrative officer	1	3,700	3	5
Do	1	3,600	2	
Agent (claims adjuster)	1	3,600	1	
Do	1	3,600	4	23
Agent (assistant claims adjuster)	2	3,000	4	
Senior administrative assistant	1	3,500	3	15
Administrative assistant	1	2,700	7	15
Agent (administrative assistant)	1	2,500	7	16
Do	1	2,500	6	13
Do	1	2,400		21
County agent	1	3,600	3	3
Do	1	3,600	1	27
Do	1	3,000	1	3
Do	1	3,000	2	2
Do	1	3,000	2	10
Do	1	2,700	2	10
Do	1	2,700	2	
Assistant county agent	1	3,600	1	19
Do	2	3,300	2	
Do	1	3,300	1	28
Do	1	3,300	1	15
Do	1	3,120		26
Do	1	3,000	2	5
Do	2	3,000	2	7
Do	1	3,000	2	3
Do	1	3,000		14
Do	1	3,000		13
Do	1	3,000	1	9
Do	2	3,000	1	19
Do	1	3,000	1	7
Do	1	3,000	1	23
Do	1	3,000	1	20
Do	1	3,000		12½
Do	1	3,000	1	25
Do	1	3,000	1	18
Do	1	2,400	1	24
Do	1	2,400	2	3
Do	1	2,400	1	26
Do	1	2,400	1	19
Do	1	2,220	1	9
Do	1	2,100	2	2
Do	1	2,040	1	5
Do	1	2,000		9
Do	1	2,000	2	
Do	1	1,980	1	18
Do	1	1,980		15
District agent (extension)	1	3,000	2	15
Do	1	3,000	7	15

TABLE 2.—*List of employees under appointment in Washington and in the field for the period March 14, 1927, to October 31, 1927, inclusive*—Continued

	Number	Salary rate	Period	
Field service—Continued.				
Salaries and wages—Continued.				
Administrative and field workers—Continued.			*Mos.*	*Days*
District agent (extension)	1	$3,000	2	18
Do	1	2,700		28
Do	1	2,400		20
Do	1	1,500		13
Assistant agent (extension)	1	3,300	2	15
Do	1	2,800	2	
Do	1	2,400		13
Do	1	2,400	2	13
Field agent (extension)	1	3,000	1	11
Do	1	2,700		28
Agent (in charge field crews)	1	2,800	5	29
Do	2	2,100	3	
Do	8	2,000	3	
Agent (county supervisor)	5	1,980	4	23
Do	1	1,980	4	4
Do	1	1,980		12
Do	2	1,980	6	7
Do	2	1,980	4	16
Do	2	1,980	3	12
Do	1	1,980	4	5
Do	1	1,980	1	11
Do	7	1,980	5	
Do	5	1,980	4	29
Do	5	1,980	4	26
Do	5	1,980	4	20
Do	1	1,980	4	12
Do	2	1,980	5	5
Do	4	1,980	4	27
Do	1	1,980	5	6
Do	1	1,980	4	17
Do	2	1,980	4	21
Do	1	1,980	4	18
Do	1	1,980	4	16
Do	1	1,980	7	14
Do	1	1,980	7	7
Do	1	1,980	6	8
Do	1	1,980	4	11
Do	1	1,980	3	26
Do	1	1,980	3	23
Do	2	1,980	4	5
Do	1	1,980	4	23
Do	1	1,980	4	24
Do	1	1,980	4	20
Do	1	1,980	4	5
Do	1	1,980	4	25
Do	1	1,980	4	27
Do	1	1,980	4	20
Do	1	1,980	3	29
Do	1	1,980	4	9
Do	7	1,920		14
Clerical employees—				
Senior clerk	1	2,400	3	5
Clerk	1	2,400	7	15
Do	1	2,100	5	20
Do	1	1,800	3	16
Do	1	1,680	5	15
Do	1	1,680	5	29
Senior accountancy clerk	1	2,100	5	22
Clerk-stenographer	1	1,800	6	8
Stenographer	1	1,560		6
Do	1	1,620		14
Assistant clerk-stenographer	1	1,500	4	11
Do	1	1,500	7	1
Do	1	1,500	5	1
Do	1	1,500	7	7
Do	1	1,440		29
Do	1	1,440	4	14½
Assistant clerk	1	1,500	7	3
Do	1	1,500	5	10½
Do	1	1,500	6	25
Do	2	1,500	5	18
Do	1	1,500	4	17
Do	1	1,500	4	13
Do	1	1,500	6	28
Do	1	1,440	3	5½
Do	1	1,440	2	24
Do	2	1,440		17

TABLE 2.—*List of employees under appointment in Washington and in the field for the period March 14, 1927, to October 31, 1927, inclusive*—Continued

	Number	Salary rate	Period	
			Mos.	*Days*
Field service—Continued.				
Salaries and wages—Continued.				
Clerical employees—Continued.				
Junior clerk-stenographer	1	$1,440	5	28
Do	1	1,440	5	22
Do	1	1,440	5	28½
Do	1	1,440	1	11
Do	1	1,320	7	2
Do	1	1,320	4	13
Do	1	1,320	2	17
Do	1	1,320	6	4
Do	1	1,320	5	14
Do	1	1,320	1	22½
Do	1	1,320		8
Do	1	1,320		12
Do	1	1,320	5	27
Do	1	1,320	7	3
Do	1	1,320	3	18
Do	1	1,320	5	15
Do	1	1,320	4	8
Do	1	1,320	2	26
Do	1	1,320	6	2
Do	1	1,320	2	13
Do	1	1,200	5	7
Do	1	1,200	5	27
Do	1	1,200	5	19
Do	1	1,200	3	
Do	1	1,200		12
Do	1	1,200	5	26½
Do	1	1,080	3	3
Do	1	1,080	1	24
Do	1	1,080	1	20
Do	1	720	2	
Do	1	720	3	
Junior clerk—typist	1	1,440	2	8
Do	1	1,320	2	4
Do	1	1,320	7	5
Do	1	1,320	4	23
Do	1	1,320	6	27
Do	1	1,320	6	24
Do	1	1,320	6	2
Do	1	1,320	2	22
Do	1	1,320	7	
Do	1	1,320		25
Do	1	1,200	3	23
Do	1	1,200	5	15
Do	1	1,200	4	29
Do	1	1,200	4	6
Do	1	1,200	1	23
Junior stenographer	1	1,380	3	20
Do	1	1,320	4	1
Do	1	1,320		26
Do	1	1,200	3	26
Do	1	1,200	1	6
Do	1	1,200	4	10
Do	1	1,200	1	20
Do	1	1,200	2	3
Do	1	1,200	2	
Do	1	1,080	1	19
Do	1	1,080	3	16
Do	1	1,080	1	5½
Do	1	1,080	4	4
Do	1	1,080	2	3
Senior typist	1	1,320	5	25
Do	1	1,320	2	18
Do	1	1,080	1	
Multigraph operator	1	1,320	5	18
Telephone operator	1	1,320	5	18
Junior clerk	1	1,440	4	9½
Do	1	1,320	4	4
Do	1	1,320	1	2
Do	1	1,320		29
Do	1	1,320	6	19
Do	1	1,200	1	12
Do	1	1,200	2	28½
Do	1	1,200	3	9
Do	1	1,200	3	1
Do	1	1,200	3	12
Do	1	1,200	3	13
Do	1	1,200	1	9
Do	1	1,200	4	12½
Do	1	1,200	5	23

TABLE 2.—*List of employees under appointment in Washington and in the field for the period March 14, 1927, to October 31, 1927, inclusive*—Continued

	Number	Salary rate	Period	
			Mos.	Days
Field service—Continued.				
Salaries and wages—Continued.				
Clerical employees—Continued.				
Underclerk typist	1	$1,200	4	7
Do	1	1,080	5	4
Do	1	1,080	3	2½
Do	1	1,080	1	7
Do	1	1,080	4	21
Do	1	1,080	4	7
Junior typist	3	1,200	1	17
Do	1	1,080	1	8
Do	1	1,080	3	23
Do	1	1,080	1	11
Do	1	1,080	1	13½
Do	1	1,080	1	23½
Do	1	1,080	1	14
Do	1	1,080	1	3
Do	1	1,080	3	28
Do	1	1,080	1	21
Do	1	1,080	1	14
Do	2	1,080	1	18
Do	1	1,080	1	9
Do	1	1,080		29
Underclerk	1	1,320	2	
Do	1	1,080	1	
Do	2	1,080	1	7
Do	1	1,080	2	27½
Do	1	1,080	4	6
Do	1	1,080	5	19½
Do	1	1,080	2	28
Do	2	1,080		12
Do	1	1,080	1	19
Do	1	1,080	4	1
Do	1	1,080	1	2
Do	1	1,080		26
Do	1	1,080	2	8½
Do	2	1,080	1	9
Do	1	1,080	1	4
Do	1	1,080	2	21½
Do	1	1,080	1	13
Do	1	1,080	4	5½
Do	1	960	1	
Do	1	1,080	1	7
Do	1	1,080	1	8½
Do	1	1,080	1	12
Do	1	1,080	2	23
Do	1	1,080	4	13½
Do	1	1,080	1	5
Do	1	1,080	4	5½
Do	1	780	2	3
Stenographer [1]	1	1,040	1	12
Do	1	1,020	1	3
Do	1	960		12
Do	1	900	2	
Do	1	900	1	22
Do	1	900	2	8
Do	1	900	1	18
Do	2	900	2	0
Do	1	900	0	13
Do	1	900	6	0
Do	1	900	1	3
Do	1	900	1	0
Do	1	840	6	0
Do	1	840	0	14
Do	1	780	0	21
Do	1	780	0	27
Do	1	780	1	14
Do	1	780	2	7
Do	1	780	1	2
Do	1	780	1	7
Do	1	720	3	0
Do	1	720	0	27
Do	1	720	2	3
Do	1	720	1	18
Do	1	720	1	16
Do	1	720	1	15
Do	1	720	2	10

[1] Includes various part-time clerical employees, and certain miscellaneous employees paid under cooperative agreement with States cooperating in the clean-up campaign.

TABLE 2.—*List of employees under appointment in Washington and in the field for the period March 14, 1927, to October 31, 1927, inclusive*—Continued

	Number	Salary rate	Period
Field service—Continued.			
Salaries and wages—Continued.			
Clerical employees—Continued.			Mos. Days
Stenographer	1	$720	2 3
Do	1	720	1 8
Do	1	660	2 3
Do	2	600	2 3
Do	1	480	0 23
Do	1	480	1 9
Do	1	480	1 3
Do	1	480	1 18
Do	1	390	2
Do	1	390	7
Do	1	360	1 18
Do	1	360	14
Do	5	300	1 21
Do	1	300	2 3
Do	1	240	1 15
Do	1	240	25
Messenger	1	1,020	2 23
Total salaries, field service			$214,274.83
Total wages, field service			1,057,384.13
Total salaries and wages, field service			1,271,658.96
Total personal services			1,318,029.05

TABLE 3.—*Reimbursement to farmers to October 31, 1927*

Indiana:	
Allen	$51,532.15
De Kalb	70,271.90
Lagrange	10,919.79
Noble	21,572.67
Steuben	56,824.44
Whitley	4,828.05
Total	215,949.00
Michigan:	
Bay	16,832.00
Branch	81,739.15
Calhoun	80,007.85
Genesee	61,822.18
Hillsdale	83,198.77
Huron	42,890.43
Ingham	63,287.11
Jackson	62,203.66
Kalamazoo	42,638.20
Lenawee	162,996.45
Lapeer	59,730.20
Livingston	48,819.85
Macomb	49,417.04
Monroe	106,296.80
Oakland	44,719.12
Saginaw	47,950.00
St. Clair	50,714.76
St. Joseph	18,925.50
Sanilac	54,925.53
Shiawassee	65,698.56
Tuscola	65,010.45
Washtenaw	88,708.75
Wayne	32,029.40
Total	1,430,561.76
Ohio:	
Allen	$26,951.48
Ashland	45,639.30
Ashtabula	54,208.40
Carroll	25,954.05
Columbiana	38,173.58
Crawford	72,416.70
Cuyahoga	12,974.25
Defiance	76,739.39
Erie	42,549.90
Fulton	95,589.97
Geauga	27,446.23
Hancock	102,856.31
Hardin	46,693.50
Harrison	21,664.87
Henry	119,397.97
Holmes	33,115.66
Huron	70,243.96
Jefferson	20,797.35
Knox	2,373.47
Lake	11,762.35
Lorain	56,638.00
Lucas	54,873.00
Mahoning	28,482.24
Marion	47,600.50
Medina	51,982.50
Morrow	26,728.87
Ottawa	45,471.00
Paulding	110,271.85
Portage	40,401.70
Putnam	60,440.20
Richland	48,861.82
Sandusky	93,969.00
Seneca	99,250.39
Stark	51,538.44
Summit	30,571.50
Trumbull	37,797.54

Ohio—Continued.	
Tuscarawas	$21, 232. 68
Van Wert	38, 106. 54
Wayne	63, 498. 66
Williams	78, 423. 65
Wood	189, 125. 63
Wyandot	50, 305. 64
Total	2, 273, 120. 04
Pennsylvania:	
Beaver	20, 913. 70
Butler	43, 548. 99
Crawford	48, 530. 38
Erie	34, 490. 96
Lawrence	30, 798. 92
Mercer	42, 909. 25
Pennsylvania—Continued.	
Venango	$14, 857. 52
Warren	10, 657. 43
Total	246, 707. 15
New York:	
Erie	19, 325. 21
Cattaraugus	7, 301. 63
Chautauqua	21, 025. 67
Total	47, 652. 51
Total reimbursement to farmers	4, 213, 990. 46

TABLE 4.—*Expenditures for the purchase of the larger items of field equipment*

[Included under equipment expenditures, Table 1]

Trucks:	
314 ½-ton trucks (Chevrolet Motor Co., North Tarrytown, N. Y.)	$172, 874. 50
194 ½-ton trucks (Donohoe Motor Co., Washington, D. C.)	82, 180. 26
100 1-ton trucks (Chevrolet Motor Co., North Tarrytown, N. Y.)	80, 295. 00
75 1-ton trucks (International Harvester Co., Chicago, Ill.)	71, 329. 50
50 3½-ton trucks, stake body (Century Motor Truck Co., Defiance, Ohio)	99, 088. 74
50 3½-ton trucks, stake body (International Harvester Co., Chicago)	124, 052. 50
50 600-gallon tank trucks (Century Motor Truck Co., Defiance, Ohio)	86, 370. 30
15 1,000-gallon tank trucks (Century Motor Truck Co., Defiance, Ohio)	32, 910. 37
Oil-burning apparatus: 64 high-pressure pumps and 600-gallon tanks mounted on 4-ton chassis, for oil-burning operations (Federal Motor Truck Co., Detroit, Mich.)	481, 552. 00
Passenger-carrying automobiles:	
75 coupes (Willys-Overland (Inc.), Toledo, Ohio)	43, 365. 00
9 sedans, 4-door (the Auburn Automobile Co., Auburn, Ind.)	8, 685. 00
Tractors:	
440 tractors, 2-cylinder, 15–27 horsepower (Deere & Co., Moline, Ill.)	283, 372. 00
360 tractors, 9–18 horsepower (Ford Motor Co., Washington, D. C.)	173, 577. 96
440 tractors, 4-cylinder, 15–30 horsepower (International Harvester Co., Chicago, Ill.)	283, 091. 80
Miscellaneous field equipment:	
12 corn binders, low cutting (John Deere Harvester Works, East Moline, Ill.)	3, 043. 80
7 corn binders, low cutting (International Harvester Co., Chicago, Ill.)	1, 461. 60
8 corn binders, low cutting (Massey-Harris Harvester Co., Batavia, N. Y.)	1, 458. 44
3 ensilage cutters (International Harvester Co., Chicago, Ill.)	1, 269. 75
3,750 feet oil hose (Boston Woven Hose & Rubber Co., Boston, Mass.)	1, 828. 30
138,000 feet oil hose, pressure (Acme Rubber Manufacturing Co., Boston, Mass.)	59, 843. 70
200 oil-burning carriages (Ohio Iron Works Co., Cleveland, Ohio)	21, 890. 00
450 plows, 18-inch tractor (Oliver Chilled Plow Works, East South Bend, Ind.)	23, 850. 00
324 plows, tractor, 3 gang (Vulcan Plow Co., Evansville, Ind.)	24, 544. 30

Miscellaneous field equipment—Continued.	
800 stubble pulverizers (International Harvester Co., Chicago, Ill.)	$102, 202. 50
195 pairs tractor and plow skids (Lansing Co., Lansing, Mich.)	8, 886. 50
25 trailers, 2-wheel (Fruehauf Trailer Co., Detroit, Mich.)	7, 377. 75
64 trailers, 4-wheel 5-ton (Fruehauf Trailer Co., Detroit, Mich.)	44, 446. 72

TABLE 5.—*Data covering clean-up area*

[Compiled as of October 31, 1927]

State	Number of farms inspected	Number acres corn inspected	Number farmers' reimbursement vouchers paid	Reimbursement acreage	Amount of reimbursement
A	B	C [1]	D	E	F
Ohio	98, 828	1, 378, 680. 10	91, 128	1, 262, 228. 10	$2, 273, 120. 04
Michigan	65, 762	811, 223. 73	61, 564	756, 251. 73	1, 430, 561. 76
New York	6, 402	34, 919. 11	5, 089	26, 825. 11	47, 652. 51
Pennsylvania	23, 982	153, 765. 92	20, 835	130, 840. 92	246, 707. 15
Indiana	7, 364	127, 416. 98	6, 737	115, 975. 98	215, 949. 00
Total	202, 338	2, 506, 005. 84	185, 353	2, 292, 121. 84	4, 213, 990. 46

State	Average acres corn per farm	Average amount reimbursement per acre	Farms on which no reimbursement was made			
			No compensation		Government work	
			Farms	Approximate number of acres	Farms	Approximate number of acres
A	G	H	I	J	K	L [2]
Ohio	14	$1. 81	6, 268	87, 752	2, 000	28, 000
Michigan	12	1. 89	2, 881	34, 572	1, 700	20, 400
New York	6	1. 78	666	3, 996	683	4, 098
Pennsylvania	7	1. 89	1, 375	9, 625	1, 900	13, 300
Indiana	17	1. 86	523	8, 891	150	2. 550
Total	12. 44	1. 838	11, 713	144, 836	6, 433	68, 348

[1] Column C includes 92,754 acres included in columns E and J on which stubble was pulverized by the Government.

[2] Column L includes work completed by Government equipment during the compulsory clean-up period only. On account of wet season this period was less than half as long as was originally anticipated. Column L does not include 92,754 acres of stubble pulverizing done by Government equipment prior to compulsory clean-up period.

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